

Find maximum area

$y = 1000 - 2x$

$$A = x \cdot y = x(1000 - 2x)$$

$$A = 1000x - 2x^2$$

$$A' = 1000 - 4x$$

set $A' = 0$

$$1000 - 4x = 0 \quad \text{so} \quad x = 250$$

$$y = 1000 - 2(250) = 500$$

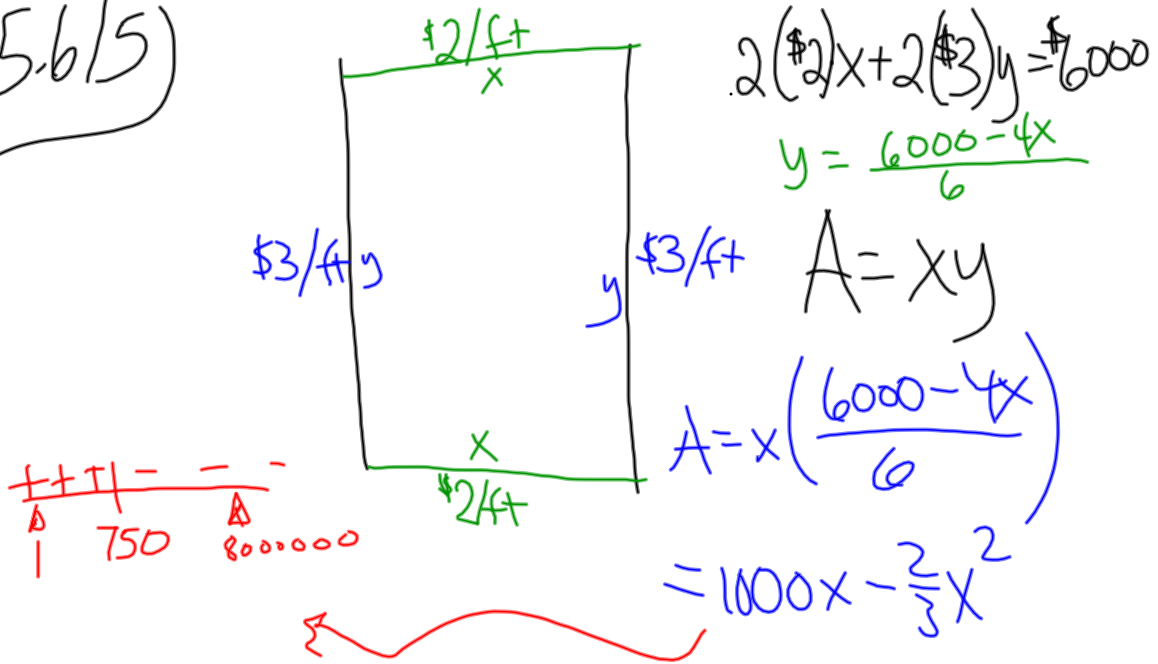


250

$\therefore x = 250, y = 500$ is

where area is a maximum

5.6/5)



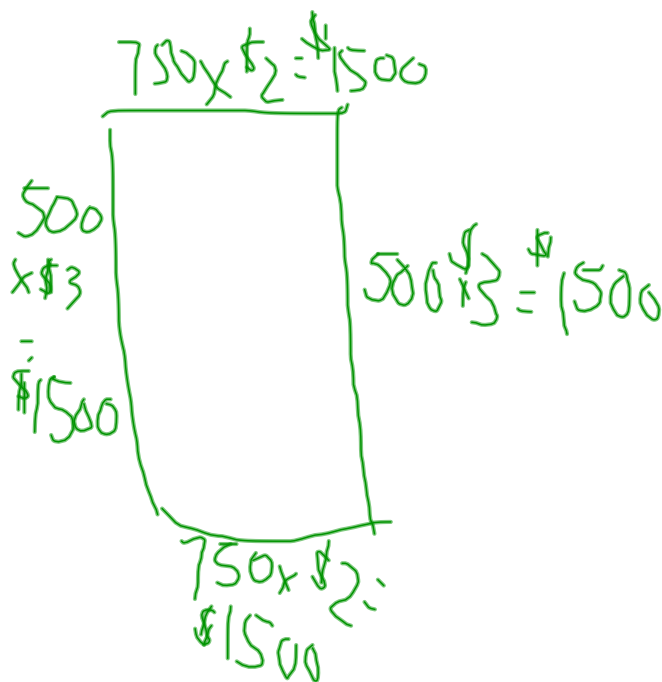
$\frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2} \frac{1}{2}$
 Δ 750 Δ 8000000

$$A' = 1000 - \frac{4}{3}x = 0$$

$$\frac{4}{3}x = 1000$$

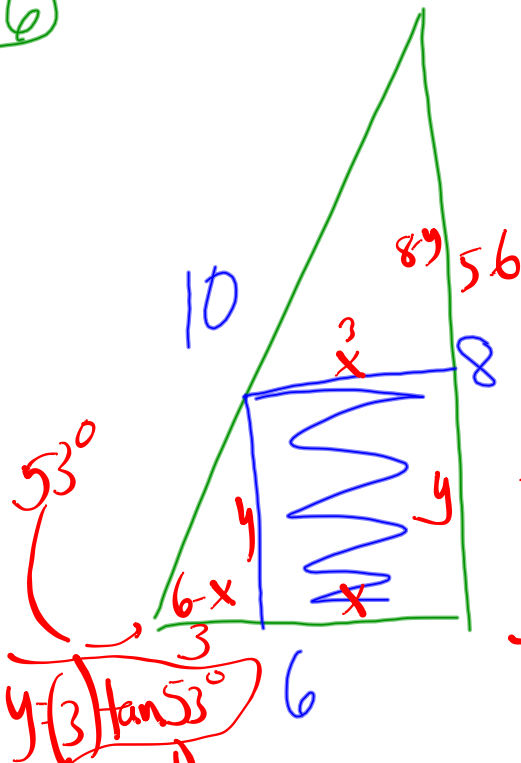
$$x = \frac{3000}{4} = 750$$

$\therefore \text{max area } x = 750, y = \frac{6000 - 4(750)}{6} = 500$



6)

Find greatest area - -



$$\frac{6-x}{y} = \frac{6}{8} \therefore 6y = 48 - 8x$$

$$y = 8 - \frac{4}{3}x$$

$$\frac{x}{8-y} = \frac{6}{8} \quad 8x = 48 - 6y$$

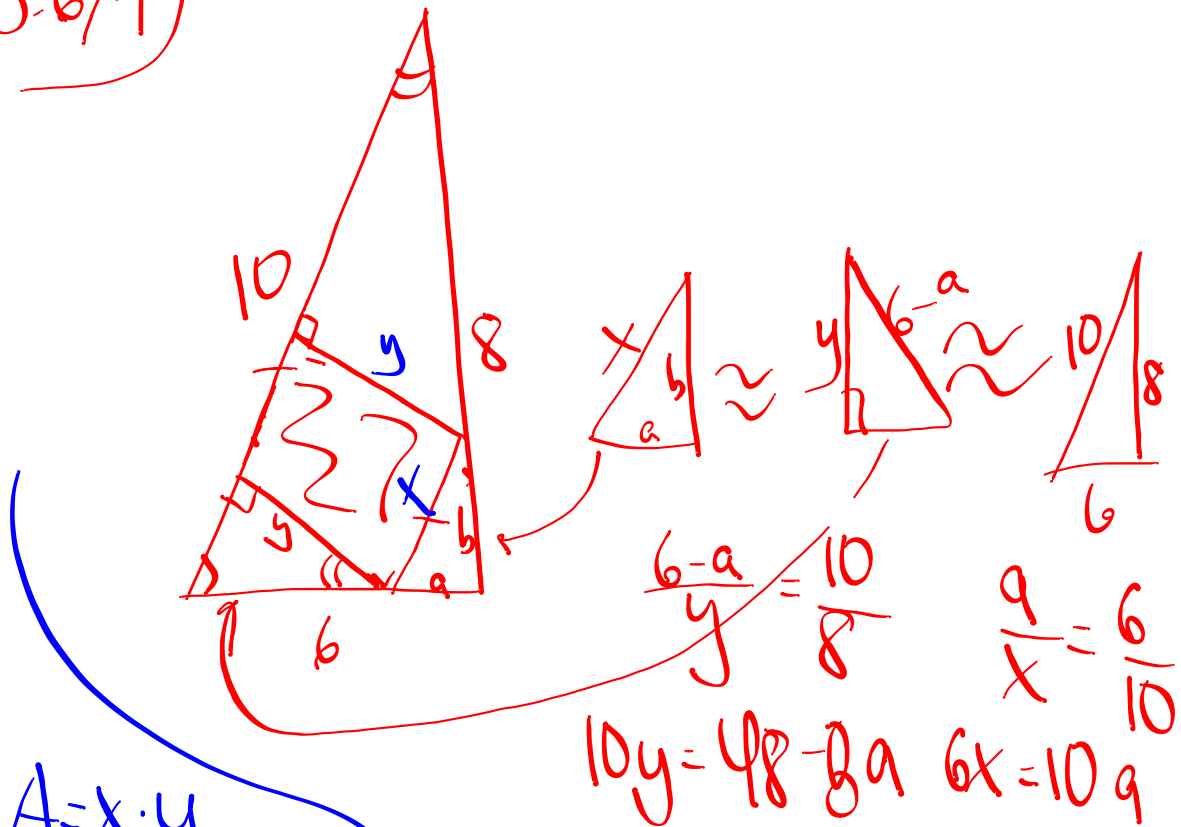
$$A = x \cdot y = x \left(8 - \frac{4}{3}x \right) = 8x - \frac{4}{3}x^2$$

$$A' = 8 - \frac{8}{3}x = 0$$

$$8 = \frac{8}{3}x \Rightarrow x = 3$$

$$y = 8 - \frac{4}{3}(3) = 4$$

5.6/17)



$$A = x \cdot y$$

$$= x \left(\frac{1}{10} (48 - \frac{24}{5}x) \right)$$

$$A = \frac{24}{5}x - \frac{24}{50}x^2$$

$$10y = 48 - 8\left(\frac{6}{10}x\right)$$

$$10y = 48 - \frac{48}{10}x$$

$$\frac{6}{10}x = a$$

$$A' = \frac{24}{5} - \frac{48}{50}x = 0$$

$$240 - 48x = 0$$

$$5 - x = 0$$

$$x = 5$$

$$y = \frac{48 - \frac{48}{10}(5)}{10} = \frac{24}{10} = 2.4$$

VI

$$A = x \cdot y$$

V.VI

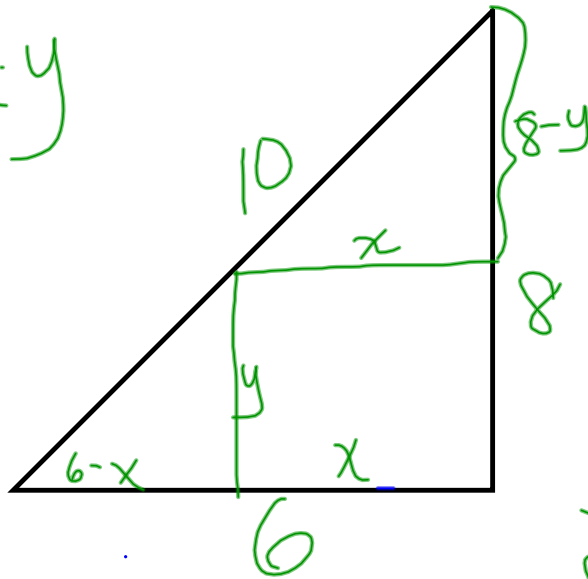
$$\frac{x}{8-y} = \frac{6}{8}$$

$$8x = 6(8-y)$$

$$8x = 48 - 6y$$

$$6y = 48 - 8x$$

$$y = 8 - \frac{4}{3}x$$



$$\frac{y}{8-y} = \frac{6-x}{x}$$

$$A = xy = (6-x)(8-y)$$

$$A = xy$$

$$A = x(8 - \frac{4}{3}x) = 8x - \frac{4}{3}x^2$$

$$A' = 8 - \frac{8}{3}x$$

$$A' = 0 = 8 - \frac{8}{3}x$$

$$\frac{8}{3}x = 8$$

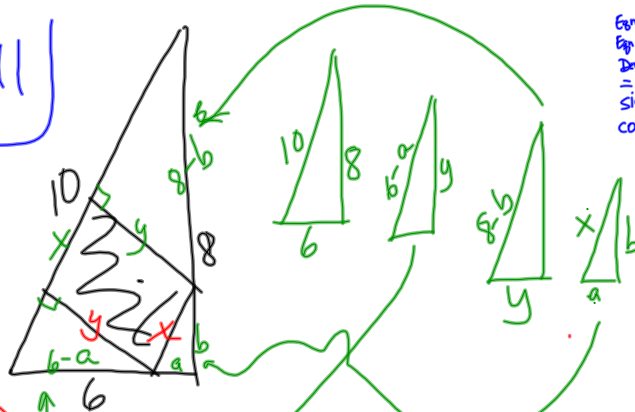
$$x = 8(\frac{3}{8}) = 3$$

$$y = 8 - \frac{4}{3}(3) = 4$$

$$\text{dim: } 3 \times 4$$

$$A = 12$$

V.VI/VIII



Eqn
Eqn in 1 var
Derivative
= 0
sign chart
conclude

$$\frac{8-b}{y} = \frac{10}{6}$$

$$10y = 48 - 6b \Rightarrow 10y = 48 - 6\left(\frac{4}{5}x\right)$$

$$y = \frac{1}{10}\left(48 - \frac{24}{5}x\right)$$

$$\frac{b}{x} = \frac{8}{10}$$

$$b = \frac{4}{5}x$$

$$\frac{6-a}{y} = \frac{10}{8} \quad A = xy = x\left(\frac{1}{10}\left(48 - \frac{24}{5}x\right)\right)$$

$$\frac{a}{x} = \frac{6}{10}$$

$$50A = 240x - 24x^2$$

$$50A' = 240 - 48x = 0$$

$$y = \frac{1}{10}\left(48 - \frac{24}{5}(5)\right) = 2.4 \Rightarrow x = 5$$

$$100A = -36x^2 + 360x$$

$$100A' = -72x + 360 = 0$$

$$72x = 360$$

$$x = 5$$

...

5.6/8

